

**PATIENT PRESENTING CLINICAL SIGNS**

**BooBoo Schuster** Owner noted yellow color on belly, urinating around the house for 1 month. M2 discomfort cranial abdomen, markedly icteric skin, sclera and MM. Waiting on Lepto test kits to come off of back order to run on this guy also.

**SPECIES** Abnormal PE/Chem/CBC/UA Results: PLT 75 K/ $\mu$ L, GLU 2.97 mmol/L, CREA 43  $\mu$ mol/L, UREA 1.3 mmol/L, ALT 351 U/L, ALKP 1749, GGT 13 U/L, TBIL 109  $\mu$ mol/L, CHOL 1.91 mmol/L, AMYL 457 U/L, cPL Abnormal Still waiting on Rad report from Idexx .

Canine

**BREED ULTRASONOGRAPHIC EXAMINATION OF THE ABDOMEN**

Chihuahua **Urinary System**

The urinary bladder is well distended with anechoic contents. The wall is smooth and regular. No abnormalities are present with the trigone or proximal urethra. A very small amount of free floating sediment is present, however, there is no evidence of cystoliths, polyps or a mass. Some of the sediment is very hyperechoic and scintillates, i.e., mild mineralization may be present. High index of suspicion of two or three long flat cystoliths in the proximal urethra.

**SEX**

Neutered Male

**AGE**

6 Years

**Prostate**

The prostate is homogenous and measures 8.44 mm in diameter.

**Kidneys**

The **left** kidney measures 4.02 cm. The capsule is smooth and its overall architecture, including the definition of the cortico-medullary junction, are preserved. Mineralizations of the diverticulae and pelvis are present, without evidence of nephroliths or pyelectasia. There are no signs of nephroliths or pyelectasia. The surrounding mesentery is hyperechoic.

**WEIGHT**

6 kg

The **right** kidney measures 3.96 cm. Findings are similar to the left kidney.

**INTERPRETED BY**

Lisa Carioto, DVM,  
DVSc, Diplomate  
ACVIM

**Aortic bifurcation/trifurcation**

No abnormalities observed.

**IMAGING PERFORMED BY**

Crystal Hill

**Adrenal Glands**

The **left** adrenal gland measures 0.48 cm at the cranial pole, 0.38 cm at the caudal pole and 1.26 cm in length. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

**HOSPITAL NAME**

BPH Stoney Creek

The **right** adrenal gland measures 0.46 cm at the cranial pole, 0.44 cm at the caudal pole and 1.47 cm in length. No abnormalities are noted with the gland's overall architecture, echogenicity or echotexture. The phrenico-abdominal vein and surrounding vasculature and mesentery are unremarkable.

**REFERRING VET**

Dr. Wittenrich

**Spleen**

The spleen is within normal limits in size, architecture, echotexture, and echogenicity. The capsule is smooth. A hyperechoic nodule, measuring 3.3 mm is observed at the tail. It is subcapsular and does not affect the integrity of the capsule. No abnormalities are observed with its vasculature, i.e. congestion and thrombi are not identified. The mesentery surrounding the spleen is severely hyperechoic.

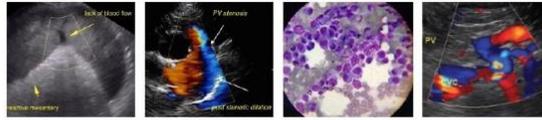
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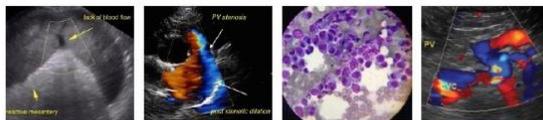
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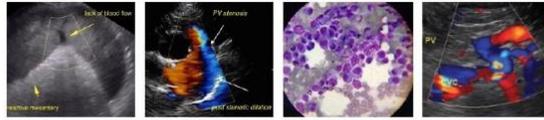
**Liver**



<b>PATIENT</b>	Severe microhepatica. The left liver has smooth, but rounded borders. The liver is diffusely hyperechoic, i.e., it is hyperechoic to the spleen. Multiple pinpoint hyperechoic foci are noted scattered haphazardly throughout the parenchyma. Occasional hypoechoic nodules of variable size are also observed dispersed throughout the parenchyma.
BooBoo Schuster	
<b>SPECIES</b>	The right liver has scalloped borders. The hepatic vein is dilated with multiple collateral veins visualized branching off of it. The hepatic parenchyma immediately adjacent to the hepatic vein and collateral vessels is moderately hyperechoic. A diffuse, mildly coarse or granular echotexture is observed. In addition to the latter, multiple hypoechoic nodules of variable size are observed throughout the parenchyma. The mesentery surrounding the liver is severely hyperechoic. The liver lobes are separated by hyperechoic tissue, suggestive of fibrosis.
Canine	
<b>BREED</b>	Multiple nodules arising from the right liver are observed, for example, 1.88 cm in height x 1.24 cm in length. A second nodule measures 0.68 cm in length. Certain lobes have a "moth eaten appearance".
Chihuahua	
<b>SEX</b>	Severe dilation of the portal vein is present, which is consistent with portal hypertension. There are no signs of thrombi.
Neutered Male	
<b>AGE</b>	The gallbladder is not visualized despite a thorough evaluation of the entire liver and surrounding area.
6 Years	
<b>WEIGHT</b>	<b>Gastrointestinal</b>
6 kg	Gas and fluid are present within the lumen of the stomach. The gastric wall is within normal limits in thickness and the wall layers are well defined, however, the submucosa is thicker than normal. Peristalsis is decreased and a mild ileus is present.
<b>INTERPRETED BY</b>	The submucosa of the small intestines are within normal limits in thickness. The definition of the wall layers is preserved, however, the submucosa is thicker than normal. Abnormally dilated loops of bowel are not observed.
Lisa Carioto, DVM, DVSc, Diplomate ACVIM	The transverse colon is filled with gas.
<b>IMAGING PERFORMED BY</b>	The colonic wall is not thickened and mural detail is considered normal.
Crystal Hill	
<b>HOSPITAL NAME</b>	<b>Pancreas</b>
BPH Stoney Creek	The <b>right limb</b> is diffusely hypoechoic and has a very subtle coarse echotexture. The surrounding mesenteric fat is moderately hyperechoic, suggestive of saponification. These findings are suggestive of active pancreatitis. Overt signs of neoplasia are not noted.
<b>REFERRING VET</b>	The body is mildly to moderately heterogeneous with a mild to moderate coarse echotexture. The mesentery surrounding the body is very mildly hyperechoic.
Dr. Wittenrich	No overt abnormalities are observed with the echogenicity or echotexture of the left limb. The mesentery surrounding the left limb is not overtly hyperechoic.
<b>INVOICE</b>	<b>Other</b>
37494	<b>Lymph nodes</b>
<b>DATE</b>	No abnormalities are observed
5/6/22	<b>Abdominal effusion</b> is not visualized.
	<b>ULTRASONOGRAPHIC FINDINGS</b>
	<ul style="list-style-type: none"> <li>The appearance of the liver is highly suggestive of cirrhosis with signs portal hypertension. A possible thrombus is observed in a transverse view of the portal vein, however, it is not</li> </ul>



<b>PATIENT</b>	visualized in any other images. An intrahepatic shunt is not visualized. No obvious signs of an extrahepatic shunt are observed. A congenital abnormality, such as a ductal abnormality or hypoplasia of the portal vein, may be the underlying cause. There are no signs of neoplasia.
BooBoo Schuster	
<b>SPECIES</b>	<ul style="list-style-type: none"> <li>The gall bladder and biliary system are not evident, however, the results of the blood work are suggestive of an obstruction, most likely extrahepatic as there are no signs of dilated intrahepatic bile ducts. Pancreatitis is a possible cause for the inflammation of the biliary tree and an elevation of the total bilirubin and icterus.</li> </ul>
Canine	
<b>BREED</b>	<ul style="list-style-type: none"> <li>The right limb and body of the pancreas are mildly hypoechoic and show signs consistent with active pancreatitis. There are no signs of neoplasia. The mesentery surrounding the liver, pancreas and cranial to mid abdomen is severely hyperechoic, which is suggestive of severe steatitis.</li> </ul>
Chihuahua	
<b>SEX</b>	<ul style="list-style-type: none"> <li>An ileus of the stomach is present. Subtle changes are present with the gastrointestinal tract that are suggestive of diffuse inflammation. Underlying inflammatory bowel disease cannot be excluded.</li> </ul>
Neutered Male	
<b>AGE</b>	
6 Years	
<b>WEIGHT</b>	
6 kg	
<b>INTERPRETED BY</b>	<b><u>INTERPRETATION OF THE FINDINGS &amp; FURTHER RECOMMENDATIONS</u></b>
Lisa Carioto, DVM, DVSc, Diplomate ACVIM	The inappropriate urination in the house is likely due to polydipsia and polyuria associated with liver disease, however, a urinalysis and urine culture and sensitivity are suggested to exclude a possible urinary tract infection.
<b>IMAGING PERFORMED BY</b>	Polymerase chain reaction for Leptospira spp. is suggested. Although it is unlikely to be the cause of cirrhosis, it may be a complicating factor. Serum and urine should be obtained for the PCR test prior to administration of any penicillin or beta lactam antibiotic.
Crystal Hill	A liver biopsy is required to confirm the underlying cause of the cirrhosis, however, treatment will not change and the procedure may cause BooBoo to decompensate. If the procedure is performed, and diazepam or midazolam is used, flumazenil should be available in case of adverse effects to sedation.
<b>HOSPITAL NAME</b>	Treatment for chronic hepatic insufficiency is recommended including a broad spectrum antibiotic to prevent the development of hepatic encephalopathy and treat a possible bacterial infection ascending from the gastrointestinal tract.
BPH Stoney Creek	Treatment for pancreatitis is recommended, including intravenous fluids and intravenous analgesics. An anti-emetic is also suggested, however, a lower dose is suggested due to hepatic metabolism.
<b>REFERRING VET</b>	A diet that is vegetarian, egg or fish based is recommended to avoid hepatic encephalopathy and the development of sarcopenia.
Dr. Wittenrich	Small frequent meals are recommended.
<b>INVOICE</b>	A hepatoprotectant, which includes glutathione, vitamin B, vitamin E and zinc is suggested. However, some dogs may develop nausea, vomiting, diarrhea and cramps.
37494	Famotidine or omeprazole may be required to decrease hyperacidity secondary to liver disease.
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BooBoo Schuster

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**HOSPITAL NAME**

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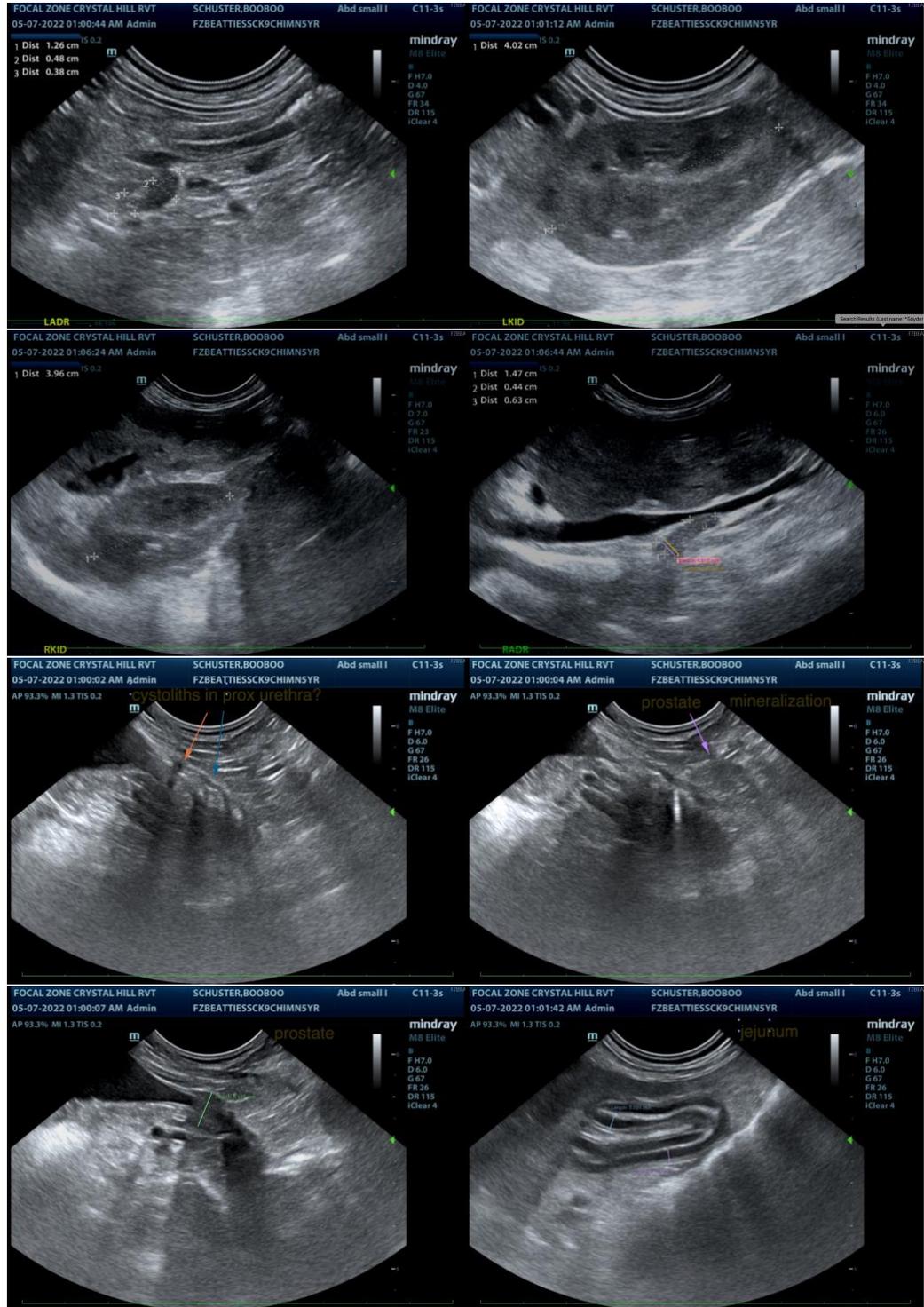
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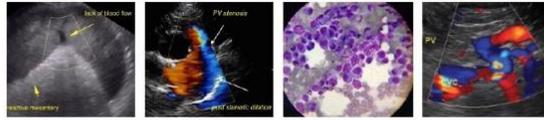
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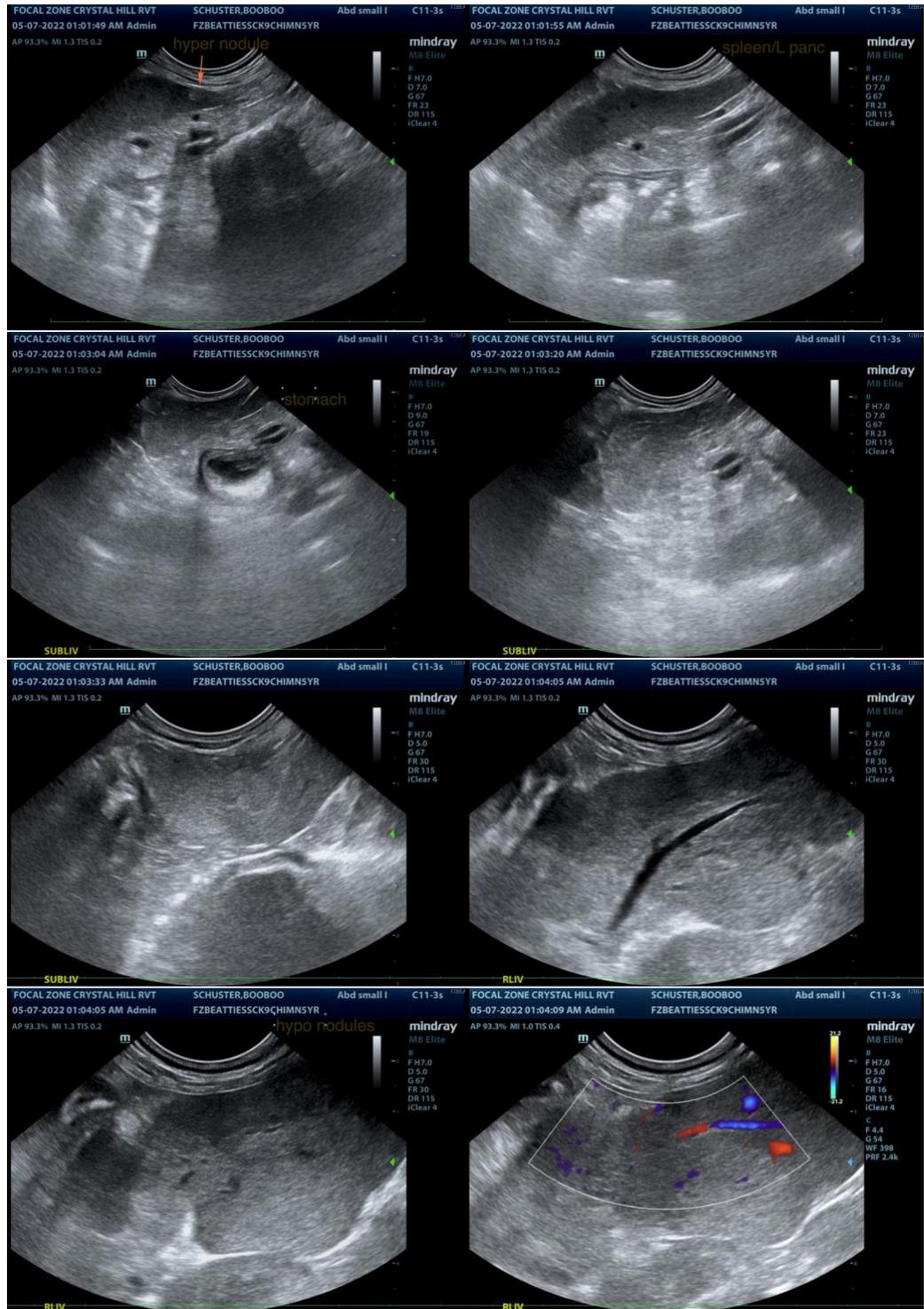
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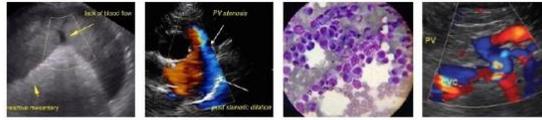
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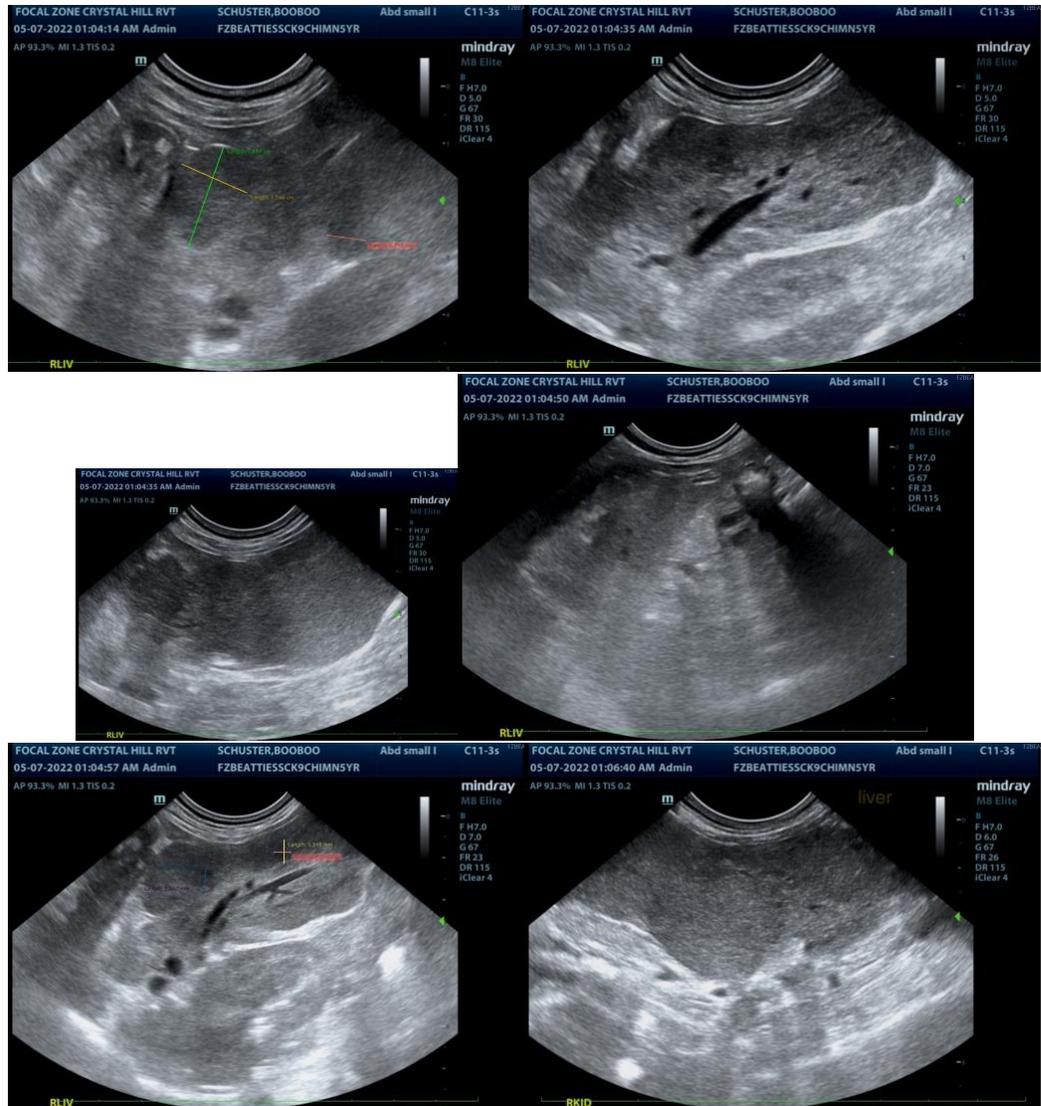
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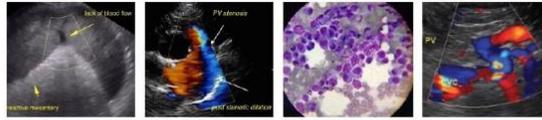
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The information and recommendations provided are based on the images presented by the referring veterinarian/sonographer. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. If the clinical or image interpretation does not parallel your findings or if I can be of any further assistance please contact me.

Lisa Carioto, DVM, DVSc, Diplomate ACVIM

[Lisa.Carioto@sonopath.com](mailto:Lisa.Carioto@sonopath.com)